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VERTICAL SCHOOLS SUBGROUP REPORT

PFAs and Schools Work Group

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BACKGROUND

The PFAs & Schools Work Group was charged with the development of recommendations on three specific topics for the Task Force on Maryland Growth and Development in October 2008. (See October 24, 2008 Final Recommendations of the APFO Work Group.)

The Three Charges of the PFAs & Schools Work Group:

1. Vertical Schools: Prepare a study on the practicality of building vertical "urban" schools in more densely built areas of PFAs. The analysis should also consider the practicality of making schools part of mixed use or transit oriented development (TOD) projects and co-location of public facilities with schools.

2. Six Year Capital Improvement Program (CIP): Develop options on the practicality of use of a Six Year State Capital Improvement Program (CIP) for Public School Construction. What would be involved in development of a Six Year State CIP for public school construction? Would a Six Year State CIP provide for better predictability to Local Education Agencies (LEAs) of State school construction projected budgets and future funding commitments in out years from the current fiscal year? Can projected budget amounts be provided by the State to the 24 LEAs with some level of accuracy and predictability? Also, what other options can be explored to assure orderly and

predictable levels of State school construction funding to LEAs up to six years from the current fiscal year?

3. Priority Funding Area (PFA) Review of School Construction: Based on the October 2008 Recommendations by the APFO Work Group, how should PFA Review of Maryland public school construction projects operate and be conducted in future years? The APFO Work Group recommended that "the 1992 Planning Act and the 1997 Smart Growth and Neighborhood Conservation Act be amended to make school construction funding decisions subject to PFA review in a similar manner to state spending decisions on water & sewer and transportation infrastructure with a different exception review process. This would restrict funding of new school capacity projects that are not located within priority funding areas with a modified exception process."

This Report deals only with Charge No.1, Vertical Schools. The other two charges are addressed in separate reports.

ISSUES AND RATIONALE

In recent years, educators, school facility planners, and local government land use planners have questioned the size of school sites. While large school sites clearly benefit their communities by providing ample outdoor recreation space, excessively large sites can also work against principles of good community planning. In Maryland, large sites are often unavailable in Priority Funding Areas (PFA) or in local growth districts, or if they are available, their cost may be prohibitive. To meet the combined requirements of cost and size, school districts are forced to seek sites outside of PFAs and growth areas, frequently in areas that are not served by municipal water and sewer. Because schools are attractive components of residential development, their location outside of PFAs may, in combination with other factors, induce sprawl patterns of urban growth. Very large sites may also inhibit establishing pedestrian connections between the home and the school site: not only are large sites frequently in remote locations, but even when they are surrounded by existing or proposed housing, the distance between home and the front door of the school may be so great and may require negotiating such intensive traffic hazards that parents will prefer to drive their children to school. An incomplete or absent sidewalk infrastructure also inhibits the connection of schools to their adjacent communities.

The preference for large school sites may also work to the detriment of existing communities and perhaps to educational goals as well. Anecdotally, it has been observed how a school facility and its educational programs can lend momentum to the revitalization of a troubled community, can in some circumstances stimulate rapid demographic shifts, and can focus the energies and commitments of citizens when they might otherwise not find common cause for community action. If smaller sites that are available in built-up areas are overlooked because of large site size standards, these communities may be deprived of the educational, recreational, and social benefits of a neighborhood school. Moreover, students will lose the benefit of attending school in the dense mixed-use, mixed-population conditions of an urbanized area. At all levels, and especially the secondary level, proximity to areas of mixed-use may provide opportunities for learning through curricular and extracurricular interaction with local economies and government functions. Proximity to homes and places of business also promotes parent and community supervision of and involvement in education.

This study was conducted with the goal of encouraging Maryland's school districts to use smaller school sites for new and replacement schools when they are educationally appropriate. Excessively large site requirements work against principles of good community planning. Large sites are often unavailable in Priority Funding Areas (PFAs) or in local growth districts, or if they are available, their cost may be

prohibitive. To meet the combined requirements of cost and size, school districts are forced to seek sites outside of PFAs and growth areas, frequently in areas that are not served by municipal water and sewer. Because schools are attractive components of residential development, their location outside of PFAs may induce sprawl growth.

Recognizing the great range of urban, suburban, and rural situations that exist in Maryland, the State does not promulgate minimum or optimal site sizes for schools. However, a number of local educational agencies (LEAs) have established minimum site sizes as policy. In conjunction with these formal directives, a general trend toward large school sites has been observed. Among the educational factors that affect site size are requirements for the physical education program (hard and soft surfaces); the environmental education program; and provision for play equipment and play space for younger children. Among non-educational factors are: the number of spaces required for vehicular and bus parking; maintenance and service requirements; increased stormwater management requirements; and community preferences. Montgomery County Public Schools writes:

> *Our building sizes have increased approximately 20-25% along with more demand for parking and other site amenities while the referenced site sizes [i.e., as specified in MCPS Regulation FAA-RA] have not changed in decades. Further… the recent changes in the stormwater management regulations (Environmental Site Design)…will require more land to meet the requirements. Up to this point, we were able to address the stormwater management requirements via underground structures. This will not be the case under the new regulations. Forest conservation requirement is another tough challenge, potentially requiring more land to satisfy the conditions.*[1]

Outdoor facilities needed to support interscholastic sports, which are not strictly needed for the educational program, are particularly demanding of space; however, these are also the facilities that lend themselves to off-site joint use arrangements with local parks and recreation departments, community colleges, or other educational institutions.

Some of these site factors may be beyond the authority of LEAs to control, but others, particularly those related to the community's perceptions of the characteristics of a good school facility, should be examined to see if alternatives are available. Visible examples of how vertical schools and smaller sites actually work, and their positive qualities as attested to by users and community members, can provide a positive influence in this effort.

SCOPE AND METHODOLOGY

The Vertical Schools Subgroup of the PFAs and Schools Work Group, Task Force on Future Growth and Development, conducted a study with the goal of encouraging Maryland's school districts to explore smaller school sites for new and replacement schools when they are educationally appropriate.

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[1] James Song, Director of Construction, Montgomery County Public Schools, email dated September 8, 2009.

Study Method and Limitations

The study group has attempted to understand the genuine educational, administrative, operational, and planning issues associated with the construction of vertical schools. The study members include architects, planners, and community members who have examined a small selection of vertical elementary schools. Elementary schools were selected for detailed study because they formed the largest number of schools in our initial sample of small schools and because they tend to be simpler in design and administration than secondary schools. Moreover, because elementary schools are the largest number of school facilities in almost every school system, the selection of sites for elementary schools may have a more widespread, if less individually intensive, impact on communities than will sites for other types of school facilities.

The study method involved direct observation and discussion with stakeholders. For each example, efforts were made to ask stakeholders questions covering a consistent set of factors (see attached draft evaluation sheet). The findings are based on anecdotal evidence rather than statistical correlations (e.g. between vertical schools and educational outcomes). One limitation of the study quickly became apparent: all of the four elementary schools in the sample are located in inner city situations, in which the density of development and the lack of larger sites mandated a vertical approach to the building design. The most critical problems noted by the stakeholders were associated with the small size of the site rather than with the vertical configuration of the building: three of the four sites are so small that the play areas are broken up into segments that cannot hold the entire school population, and because these play areas are not adjacent to the lunch area, internal circulation and supervision is very staff-intensive and forces the school to hold multiple lunch periods. Thus the general conclusion of our group is that these inner city school sites are simply too small to adequately serve an elementary school program (this does not, however, detract from the popularity of these schools with their teachers and community members, for other reasons). However, the example of the fourth school, the J. F. Oyster School in Washington, DC, shows that only a marginal increase of site size allows the play areas to be consolidated so that the entire student body can use it at one time; in conjunction with good interior space planning, the slightly larger site largely removes the circulation and supervision problem.

In Maryland, situations similar to those in our detailed sample are found in Baltimore City and the more densely developed portions of our urbanized areas. However, the critical case is not the occasional new inner city school for which there is no choice but a very small site; the more typical situation will be the choice between a smaller site within the approved growth area and a larger site outside of the growth area. Here, the often-cited problem of cost vs. location comes into play. Generally, sites under considerations in growth areas will be larger than the inner-city sites examined in this study. Consequently, a more comprehensive study would examine elementary schools on sites of 4 to 7 acres.

Finally, we are aware that the benefits and problems associated with small elementary school sites may not translate to secondary schools. Several of our commentators remarked that the close quarters of their vertical elementary schools, and especially the large number of staircases, which can be accommodated in an elementary school setting, would be highly problematic with secondary students: “more students with the potential to be in more places”, as one commentator put it, can create opportunities for conflict and misbehavior that only very intensive staff supervision can prevent from becoming disruptive or even dangerous. Again, a more comprehensive study would examine at least the same number of middle and high schools as the number of elementary schools that were investigated in this study.

Recognizing this limitation in the sample, important findings have emerged that will have general application to vertical schools and small sites.

DEFINITION

For purposes of this study, a vertical school is defined as a school building that is at least three stories high for a majority of the building bulk. A school with multiple semi-stories will be considered a vertical school only if a substantial portion of the building is within a three story structure.

Two story school buildings are the norm in many parts of Maryland, and three story buildings are not uncommon. Therefore, for purposes of this study, the interest of the workgroup has been directed to schools that are four or more stories in height in order to clearly understand their benefits and possible problems.

VERTICAL SCHOOL EXAMPLES

The following schools were selected for detailed study:

- Beebe School, Malden, Massachusetts (Fig. 1)
- Jean Parker School, San Francisco (Figs. 2 - 4)
- J. F. Oyster Bilingual Elementary School, Washington, D.C. (Figs. 5, 6)
- Tenderloin Community School, San Francisco (Figs. 7, 8)

GENERAL FINDINGS

This report does not contain specific recommendations on this topic; instead the study group provided a set of General Findings on the topic of Vertical Schools along with specific School-Based Findings related to issues that were found at the specific schools in the study.

These findings are intended as an overview of the issues associated with the construction of Vertical Schools. The findings are to serve as a guide for further study and development of a set of recommendations regarding the construction and funding of Vertical Schools in Maryland

<u>Design</u>

Specific design problems and suggestions are outlined under the School-Based Findings of this paper (page 7). However, discussions with school administrators make clear that small, vertical schools present unique issues of circulation, supervision, safety, and adjacency that must be addressed very carefully in the design process. As for any school design, early and consistent involvement in the design process of knowledgeable central office and school staff, and possibly of community members, can avert many of these potential problems.

The most critical design problems noted by the stakeholders were associated with the small size of the site rather than with the vertical configuration of the building: three of the four sites are so small that the play areas are broken up into segments that cannot hold the entire school population, and because these play areas are not adjacent to the lunch area, internal circulation and supervision is very staff-intensive and forces the school to hold multiple lunch periods. Difficulties were also noted with dropping off students, with the difficulty of providing even minimal on-site parking for visitors and evening events, and with delivering services to the schools in tight urban traffic situations. Several interviewees noted that

vertical building configurations require more staff supervision of student movements, consequently they reduce the amount of time that teachers have available for planning.

Thus there are situations in which a school site may be so small that it can create obstacles to the smooth delivery of the elementary school program. However, the example of the fourth elementary school, the J. F. Oyster School in Washington, DC, shows that only a marginal increase in the size of the site allows the play areas to be consolidated so that the entire student body can use it at one time. In conjunction with good interior space planning which co-locates the cafeteria, the gymnasium, and the exits and entrances to the exterior play areas, the slightly larger site removes much of the circulation and supervision problem experienced by the other three schools. Most, but not all of the other difficulties noted in the School Based Findings section can be resolved through good architectural design.

Jurisdictional authority: In Maryland, design decisions for school facilities, including the size of the school site, have been delegated to the Local Education Agencies (LEAs). The State has a minimum number of design and construction standards that must be adhered to, but it does review the design of all major projects for conformance with the educational specifications that have been approved by the local board, good educational practice (e.g., acceptable sizes of classrooms for different age groups), and good design practice (e.g. preferred use of ducting for HVAC return air). With respect to design, the State serves as a conduit of best practices among the LEAs and gives recognition to good design practices.

School size vs. site size: While it is clear that a horizontally extended school of one or even two stories will generally require a large site, the converse is not necessarily true: even if the school is designed to have a small footprint by stacking floors, site size may be independently driven by the other educational and non-educational factors noted above.

In addition, the planning goals of increasing walking and reducing vehicle miles traveled (VMT) may be thwarted, even when the school is located on a small site, by the lack of sidewalks connecting homes to the school, by the absence of viable public transit to serve students, staff, and community members, or by the perception or reality of threats to children's safety and security.

Acquisition of sites: For many LEAs, school sites have been in the board's property inventory for many decades or have been recently donated by developers through proffer transactions. Neither type of site may be in an optimal location relative to the affected student body or from the perspective of good community planning principles. It is the rare situation in which a board of education seeks a new site, and the recent history of such searches in Harford County and St. Mary's County indicates the difficulty of meeting the board's size and cost parameters. Three topics for further discussion are raised by this situation:

1. Should the State participate in the acquisition of sites? Since its origins in 1971, the Public School Construction Program has provided funding only for costs directly associated with facility and site improvements, not with site acquisition. Barring a new funding program, State participation in site acquisition will reduce the amount of funding available statewide for facility improvements; however, this assistance might make the critical difference in letting the LEA select a more expensive site in the growth area rather than a larger but less expensive site outside of the growth area.

2. How can LEA land banking be encouraged by the State? Initially, it would be necessary to know which LEAs actively pursue land banking.

3. How can the State encourage LEAs to pursue innovative alternatives, including use of off-site local facilities for physical education and redevelopment of existing commercial buildings when appropriate?

Community Redevelopment and New Residential Communities: The use of vertical schools in existing communities should be distinguished from their application in new communities. Since most of the examples listed above are small sites in heavily urbanized areas of American cities, building vertically was most likely the only option available to meet the enrollment and programmatic objectives. Though these very small sites are far from optimal for educational purposes, nevertheless the principal and staff at each school have been able to develop schedules and practices that accommodate to the physical constraints. Somewhat larger sites, such as those likely to be found in Maryland's designated growth areas, would likely remove the hindrances that were noted by our stakeholders.

However, residents of new communities have often selected their homes from a preference for a low-density suburban lifestyle, and they consequently expect that their neighborhood school will meet *suburban* standards for size and site amenities. Vertical schools on small sites may suggest an *urbanized* environment that is at odds with community preferences. This situation may apply to new communities even within PFAs or local growth areas. A recent example from Prince George's County suggests that developers are attuned to this preference and may resist the idea of providing a smaller site for a vertical school. However, another recent example, the Pike Road School in the Town of Pike Road, Alabama (on the eastern periphery of Montgomery), also indicates that a smaller school may be acceptable in a community designed on neo-traditional town development (TND) principles, where the small size of the school site was off-set by other community amenities, and where it is likely that the residents enter the community with an expectation of a more urbanized lifestyle.

In Maryland, a large number of communities are in transition from a suburban to an urban pattern of land development. It is suggested that a future study examine how these LEAs are addressing the problem of smaller and fewer sites for new school construction.

SPECIFIC SCOOL-BASED FINDINGS

Note: An effort has been made to include only those points that are relevant to the vertical schools/small site issue. The stakeholders often had suggestions that would be applicable to school design in general, these have not been included below.

Schools and Contacts:

- Beebe School, Malden, MA
- Jean Parker School, San Francisco, CA (Janet Dong, Principal)
- J. F. Oyster Bilingual Elementary School, Washington, D.C. (Mary Filardo, 21st Century School Fund)
- Tenderloin Community School, San Francisco, CA (Dr. Packer, former Principal)

Educational

► BS: Beebe School, Malden, MA

- Small size can lead to smaller-than-normal instructional spaces (classrooms, small gym), spaces of unusual configuration ("bowling alley spaces"), or interior instructional spaces lacking windows. The utility of these spaces may be limited.
- Having classrooms on multiple floors does not appear to inhibit teacher interaction.

► JP: Jean Parker School, San Francisco, CA

- Small building size may mandate a single-loaded configuration. Single-loaded corridors should be avoided if possible, since they tend to isolate classrooms from one another. This can be overcome to some extent by having doors connect from classroom to classroom. If the single-loaded corridor looks down on an outdoor or indoor space, it is essential for the railings to be designed to prevent falls or objects being thrown.
- Small site and taller building require staff to take on more duties than usual. No indication this cuts into teaching time, but it may cut into planning time, and could have an impact on turnover, morale, etc.

► TC: Tenderloin Community School, San Francisco, CA

- Takes more effort to establish collegiality, staff needs to be more organized than in a large school.
- Instruction is not impacted by the small size. The school is located close to a BART station and City Hall, is new, and has underground parking: it is seen as a very desirable place to teach, and teachers accommodate to the challenges. Dr. Packer: "Any site can work with the right staff".

<u>Administrative</u>

Vertical Configuration

► BS: Beebe School, Malden, MA

- Climbing four flights of stairs is no problem, the children are winded and consequently cause less trouble. However, teachers may also get winded.

► JP: Jean Parker School, San Francisco, CA

- Increasing the number and length of staircases increases the staffing requirements for supervision.

► TC: Tenderloin Community School, San Francisco, CA

- The number of staircases mandates more planning, and imposes more duties on staff. Students can be in more locations.
- Problems would increase exponentially for middle school or high school.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C.

- Everyone fights for space on the first floor. There's a need to be creative with adjacencies.
- Oyster forms a single K-8 school in conjunction with another campus about ½ mile away. A number of staff members move between the two campuses. If this can coordinated, it appears to be a way to compensate for some of the deficiencies that small size imposes.
- Designed with a toilet and water fountain in every classroom, reducing the need for hallway movement. If this isn't possible, then toilets and water need to be near the classrooms, and locating boys and girls toilets next to each improves hallway supervision.
- Another strategy is to locate administrative areas on each floor, as is done in a Queens, New York school of 6 stories and 5,000 students <check this figure>. However, this can create problems for parents trying to figure out who they need to talk to about their students.

Rooftop play areas

► JP: Jean Parker School, San Francisco, CA: May require nets to prevent balls from being thrown onto adjacent roofs and lots.

Segmentation, size of play areas

► BS: Beebe School, Malden, MA: No play fields or green space.

► JP: Jean Parker School, San Francisco, CA

- If small site size requires that the play areas be segmented, for example by using roof surfaces as well as ground surfaces, additional staffing is likely to be needed to supervise multiple groups of children. Staff limitations will require that some teachers be on outdoor supervision duty during these times, and since they must be in their classrooms at other times, it may not be possible to schedule teacher planning sessions with every teacher present.
- This arrangement also generates problems in holding all-school assemblies or other outdoor events, and can generate very significant circulation management situations. For elementary schoolers, recess follows lunch, so a continuous sequencing of groups of students is needed. For middle schoolers, more time in the corridor or staircase is more time and opportunity for trouble to develop. If segmenting the outdoor areas cannot be avoided, it is essential to have excellent communication equipment so that scheduling can be coordinated. Installing additional staircases can help the circulation problem, but probably aggravates the staff supervision issue.

► TC: Tenderloin Community School, San Francisco, CA

- "Lunch is a nightmare" (Dr. Packer)
- Better to have one playground area (the school has two, one on 1st level and one on the roof).
- The cafeteria would support two lunch periods, but because the post-lunch play areas are so small, the size of the lunch groups must be kept small, resulting in four lunch periods that cover 1-1/2 hours.
- The distance of the play areas from the lunch room creates circulation problems: students can't be dismissed to the outside, paraprofessionals must lead them up and down to the play areas.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C.

- Because of the size of the outdoor play area and its good relationship to the multipurpose room, Oyster allows all of the students to be outdoors at one time (Note: the site is only marginally larger than the Jean Parker or Tenderloin school sites, but all of the play space is consolidated. The building footprint is only 12,000 s.f.).
- The gym is also adjacent to the multipurpose room, allowing indoor play in bad weather to take place smoothly after lunch. The importance of this second assembly space was stressed.
- Topography works to the advantage of this school, allowing entry on two floors.
- It's important to program the outdoor space, thinking in advance about how the play and social spaces will be used.

<u>Planning</u>

► JP: Jean Parker School, San Francisco, CA:

- Density of urban situation and lack of on-site parking lead to a very high percentage of walkers.

<u>Operational</u>

Safety and Security

► JP: Jean Parker School, San Francisco, CA:

- Vertical configuration demands greater vigilance to identify possible harms, e.g. gaps that a child could squeeze through and have a fall, or ways children could throw items onto lower levels.

► TC: Tenderloin Community School, San Francisco, CA:

- A security guard was provided in the first year to clear out the vagrants from the alley; currently there is no guard, but the intruders appear to be harmless.

Interior Circulation

► BS: Beebe School, Malden, MA

- Monumental stair in lobby does little for circulation.

- Circulation pattern needs to be very clear and intuitively obvious (e.g. in a building with four corners, include four stairways even if not required by code).

► JP: Jean Parker School, San Francisco, CA
- Small size and vertical configuration demand intricate circulation patterns. Not generally a problem for tractable elementary school children, but the combination of close quarters and staircases could make middle or high school more difficult. Lockers should be provided in lobbies, not in the circulation spaces because of their tightness.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C:
- Having windows in the stairwells and hallways prevents occupants from losing the sense of orientation as they move through the building.

Vehicular Circulation

► BS: Beebe School, Malden, MA
- Dense urban condition prevents construction of a drop-off lane or space, and all children need to exit on one side of building because of adjacent highway on other. This results in a lengthy exit period (20 minutes).
- No loading dock, all supplies are delivered through front door.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C
- Most students are walkers, bussed, or dropped off; there is pull-over space for 12-15 cars.

Parking

► BS: Beebe School, Malden, MA
- Lack of parking is a problem (mitigated by allowing teachers to park on residential streets).

► JP: Jean Parker School, San Francisco, CA
- Structured parking is convenient for staff, but can present a security problem because it's accessible to the public during after-school pick-up time. Cameras are essential.
- On-site parking needs to be provided for evening events; a street-level courtyard with gate and absence of plantings can serve the purpose.

► TC: Tenderloin Community School, San Francisco, CA:
- Underground parking isn't accessible to parents and outsiders, so there's no problem.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C
- New school has 33 spaces (old had only 18). Although Metro stop is nearby, many staff members don't use it.
- The garage has a card reader but is left open for parents after school hours (after-school activities go on until 6:00 P.M.). Apparently security isn't a problem in this location.

<u>Community Use and Identification</u>

► BS: Beebe School, Malden, MA & JP: Jean Parker School, San Francisco, CA:
- High level of use by communities.

► TC: Tenderloin Community School, San Francisco, CA
- Community insisted that the school be named after the Tenderloin.
- School has a full dental clinic providing free service for the students only.
- The school also houses 14 self-contained sections for emotionally disturbed children from around the system. The lack of community opposition is indicative of the social disorganization of the Tenderloin (school is 80% FRPS, 60% ELL); the program could not have been placed in the high performance school in which Dr. Packer is now principal. However, the parents of the TC students are so grateful for the school that a certain level of parental involvement occurs.
- People in the community see the multipurpose room, the library, and the rooftop play area as benefits.

► OS: J. F. Oyster Bilingual Elementary School, Washington, D.C
- The school uses its gym etc., but the community could have access.

Fig. 1 Jean Parker School, San Francisco, California

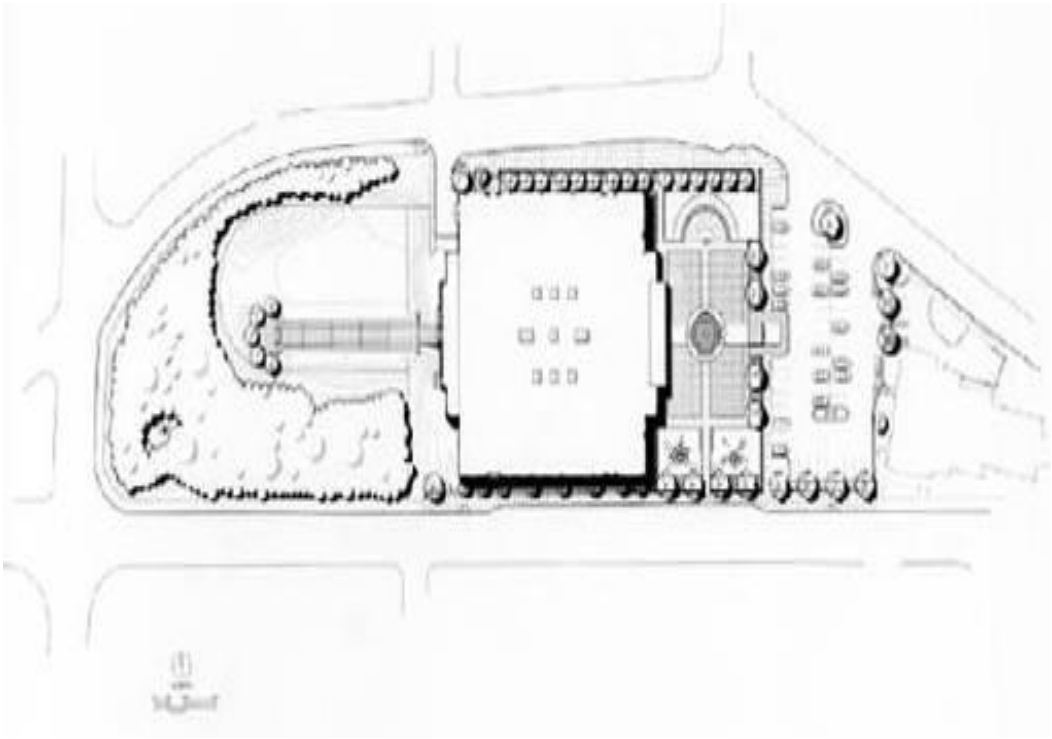

Fig. 2 Beebe School, Malden, Massachusetts: Site Plan

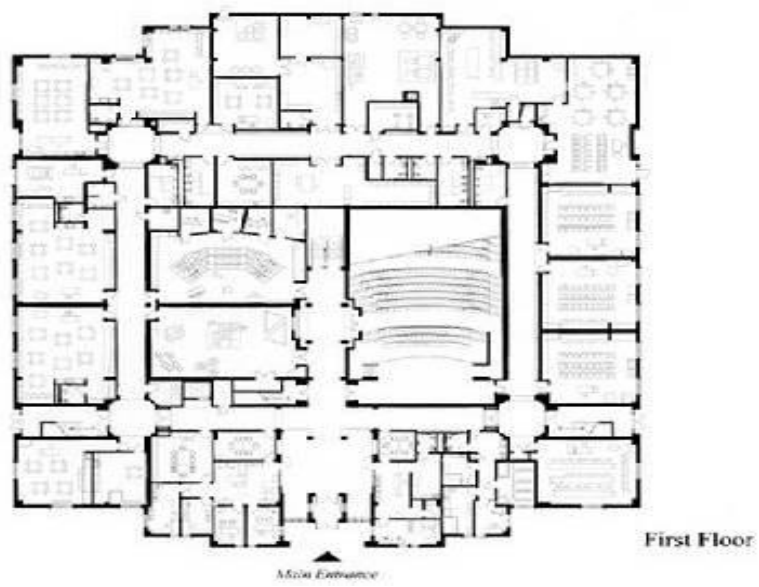

Fig. 3 Beebe School, Malden, Massachusetts: First Floor Plan

Fig. 4 Beebe School, Malden, Massachusetts

Fig. 5, 6 Tenderloin School, San Francisco, California

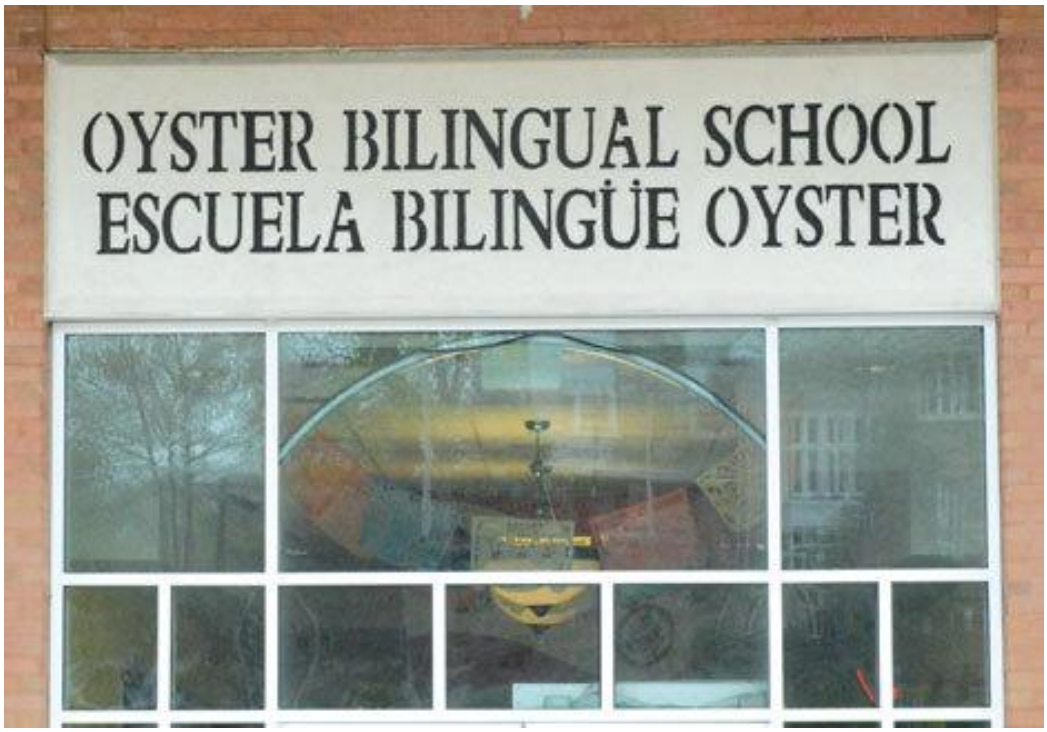

Fig. 7, 8 The Oyster School, Washington, DC